Appendix E

Draft Technical Memorandum:

Recommended Tools for Addressing Water Quality and Watershed Protection Principles

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POTENTIAL TOOLS FOR ADDRESSING WATER QUALITY AND WATERSHED PROTECTION PRINCIPLES

prepared for

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PURPOSE OF THIS DOCUMENT

The purpose of this document is to provide descriptions of a range of planning tools that could be considered by the Sacramento Stormwater Management Program Permittees (Permittees) to amend their existing programs as needed to better address water quality and watershed protection principles. The principles are outlined in the Sacramento NPDES Stormwater Permit No CAS082597, Provision 16a. The tools discussed in this memorandum could be incorporated into general or community/ specific plans, policies, codes, standards and guidelines that direct or guide land use decisions.

This memorandum presents the tools in three categories: plans and policies, ordinances and codes, and design/ improvement standards and guidelines.

A Tools Matrix is included, which relates each proposed tool to the principle(s) addressed. Following the matrix, each tool is described in further detail, with drawings, web site links, local examples and examples from other programs in the state or the nation.

WATER QUALITY AND WATERSHED PROTECTION PRINCIPLES

The Stormwater Permit requires the Permittees to review and update their existing development standards program. Provision 16a requires the Permittees to incorporate water quality and watershed protection principles into planning procedures and policies such as: the General Plan or equivalent plans (e.g. Comprehensive, Master, or Community Plan) to direct land use decisions and require implementation of consistent water quality protection measures for all development projects. Such water quality and watershed protection principles and policies must consider the following:

Permit Provision 16a

i. Minimize the amount of impervious surfaces and directly connected impervious surfaces in areas of new development and redevelopment and use on-site infiltration of runoff in areas with appropriate soils where the infiltration of storm water would not pose a potential threat to groundwater quality. (16a.i)

ii. Implement pollution prevention methods supplemented by pollutant source controls and/or treatment controls. Where practical, use strategies that control the sources of pollutants or constituents (i.e., the point where water initially meets the ground) to minimize the transport of storm water and pollutants offsite and into MS4s. (16a.ii)

iii. Preserve and, where possible, create or restore areas that provide important water quality benefits, such as riparian corridors, wetlands and buffer zones. (16a.iii)

iv. Limit disturbances of natural water bodies and natural drainage systems caused by development, including roads, highways, and bridges. (16a.iv)

v. Use existing drainage master plans or studies to estimate increases in pollutant loads and flows resulting from projected future development and require incorporation of structural and non-structural BMPs to mitigate the projected increases in pollutant loads in runoff. (16a.v.)

vi. Identify and avoid development in areas that are particularly susceptible to erosion and sediment loss, or establish development guidance that protects areas from erosion and sediment loss. (16a.vi)

vii. Implement source and/or treatment controls as necessary to protect downstream receiving water quality from increased pollutant loads in runoff flows from new development and significant redevelopment. (16a.vii)

viii. Control the post-development peak storm water run-off discharge rates and velocities to prevent or reduce downstream erosion, and to protect stream habitat (16a.viii)

TOOLS MATRIX

The Tools Matrix presented in this section is the result of an information-sharing workshop held with the Permittees and experienced stormwater planning consultants in August 2003. It includes almost 40 tools and shows the water quality or watershed protection principle addressed by each, along with a page number for locating additional details about each tool. The matrix suggests how each tool addresses each of the eight Development Standard Principles. A bullet (●) indicates that a tool, in the judgement of the workshop participants, addresses a particular principle.

Plans & Policies

			Addresses Development Standard Principles*							
	PAGE	TOOL	i	ii	iii	iv	v	vi	vii	viii
PP.1	5	Incorporate smart growth principles in General Plan.	●		●	●		●	●	●
PP.2	6	Adopt a transit-oriented land use designation in the General Plan.	●		●	●		●	●	●
PP.3	6	Encourage new or denser development near transit nodes.	●		●	●		●	●	●
PP.4	7	Encourage cluster and compact development.	●		●	●		●	●	●
PP.5	7	Adopt context-sensitive design for streets as a planning principle.	●	●					●	
PP.6	8	Encourage reduced parking lot coverage.	●							
PP.7	8	Protect and strengthen existing ecological systems.		●	●	●		●	●	●
PP.8	10	Maximize opportunities for creating open space.			●	●		●	●	●
PP.9	10	Regulate development adjacent to waterways.			●	●		●	●	●
PP.10	12	Take advantage of opportunities presented by joint use facilities.		●					●	●
PP.11	12	Maximize use of pervious pavements.	●	●					●	●
PP.12	13	Maintain or establish open space requirements or buffer zones at creeks, create or preserve natural meanders.			●	●		●	●	●
PP.13	13	Maintain surface and groundwater quality.	●	●	●	●		●	●	●
PP.14	14	Maintain quality and quantity of surface and runoff water to existing flows and quantities.	●	●	●	●		●	●	●
PP.15	14	Encourage public access and building orientation to open space; especially along creeks.	●	●					●	●
PP.16	15	Develop hillside development ordinances to stipulate topographic sensitivity, setbacks, approval process		●			●	●	●	●
PP.17	16	Assess pollution loads and flows as new master plans are proposed.					●			

*Principles: i. Minimize impervious surfaces, use infiltration, where feasible.
ii. Implement pollution prevention source and treatment controls.
iii. Preserve, create, restore riparian corridors, wetlands and buffer zones.
iv. Limit disturbances of natural water bodies and drainage systems.
v. Use existing drainage plans to estimate increases in loads and flows.
vi. Protect sensitive areas from erosion and sediment loss.
vii. Implement BMPs to protect downstream receiving water.
viii. Control peak storm water run-off rates and velocities.

Codes & Ordinances

	PAGE	TOOL	Addresses Development Principles* i	ii	iii	iv	v	vi	Standard vii	viii
CO.1	17	Adopt smart growth codes and ordinances.	●		●	●		●	●	●
CO.2	17	Adopt transit-oriented zoning codes and ordinances.	●		●	●		●	●	●
CO.3	18	Adopt context-sensitive street design in zoning codes and ordinances.	●		●	●		●	●	●
CO.4	18	Develop codes and ordinances to regulate property along wetlands and riparian corridors.			●	●		●	●	●
CO.5	19	Develop hillside development ordinances to stipulate topographic sensitivity, setbacks, approval process (see PP.16.)		●			●	●	●	●
CO.6	19	Author code to reduce pollutants in stormwater.		●					●	●
CO.7	20	Stipulate legal authority to require source and treatment controls are given to agency head.	●	●					●	●

*Principles: i. Minimize impervious surfaces, use infiltration, where feasible.
ii. Implement pollution prevention source and treatment controls.
iii. Preserve, create, restore riparian corridors, wetlands and buffer zones.
iv. Limit disturbances of natural water bodies and drainage systems.
v. Use existing drainage plans to estimate increases in loads and flows.
vi. Protect sensitive areas from erosion and sediment loss.
vii. Implement BMPs to protect downstream receiving water.
viii. Control peak storm water run-off rates and velocities.

Standards & Guidelines

			Addresses Development Principles*						Standard	
	PAGE	TOOL	i	ii	iii	iv	v	vi	vii	viii
SG.1	21	Develop context-sensitive street standards and guidelines.	●	●					●	●
SG.2	22	Develop parking standards requiring pervious paving.	●	●					●	●
SG.3	22	Author standards to regulate development adjacent to waterways.		●	●	●		●	●	●
SG.4	23	Incorporate BMPs in new and re-development and require them as a condition of approval for projects.	●	●			●		●	●
SG.5	23	Establish design standards for BMP's		●						
SG.8	24	Develop a plant selection list to advise users.		●	●			●	●	●

*Principles: i. Minimize impervious surfaces, use infiltration, where feasible.
ii. Implement pollution prevention source and treatment controls.
iii. Preserve, create, restore riparian corridors, wetlands and buffer zones.
iv. Limit disturbances of natural water bodies and drainage systems.
v. Use existing drainage plans to estimate increases in loads and flows.
vi. Protect sensitive areas from erosion and sediment loss.
vii. Implement BMPs to protect downstream receiving water.
viii. Control peak storm water run-off rates and velocities.

DESCRIPTION OF TOOLS

This section of the memorandum presents descriptive information and local/national examples of how the tools can be applied. Drawings and web site links are also provided where available.

PP.1. Incorporate smart growth principles in General Plan.

"Smart growth is not a predetermined utopian vision of the future. It is rather an attempt to correct the ills of our current development pattern in principled and time-tested ways. Many of the principles of smart growth are not new. They are based on practices that have produced some of our most desirable living environments, be they small towns, suburban communities, or large cities. Smart growth does not seek to overturn the wishes of residents or communities desiring a more dispersed lifestyle, nor does it attempt to prescribe a one-size-fits-all pattern for living. It is primarily a series of alternatives to current development patterns that seeks to alleviate some of our current urban woes.

All smart growth principles involve the concept of promoting more livable and functional communities. Advocates define smart growth communities as environments that:

- enhance mobility for all residents, not just those with automobiles, as they carry out daily tasks, such as traveling to work or school, shopping, and maintaining community ties;
- accommodate the need for new housing, employment growth, and population increase by making the most efficient use of urban land;
- preserve and protect important open space and species habitat;
- are respectful of the needs of neighboring jurisdictions and the region as a whole; and
- make the carrying out of smart growth practices by developers, lenders, builders, and other interested parties as simple and streamlined as possible."

(Source: Smart Growth in the San Francisco Bay Area: Effective Local Approaches. San Francisco District Council of the Urban Land Institute http://sfbayarea.uli.org/smartgrowth.pdf)

Smart growth has a beneficial impact on stormwater quality because it concentrates development and enables preservation of open space, natural resources, and the environment. The following are examples of jurisdictions that have incorporated smart growth into their General Plan.

Example 1. City of Sacramento, General Plan, Overall Urban Growth Policy Statements

Policy 4 – New Growth Areas
It is the policy of the City to approve development in the City's new growth areas that promotes efficient growth patterns and public service extensions, and is compatible with adjacent developments. Page 1-32

- New growth area development will be allowed when all necessary infrastructure is available or will be provided, if is consistent with the City's urban growth and annexation policies, and promotes orderly and efficient growth.

Policy 5 – Urban Conservation and Infill Areas
It is the policy of the City to promote the reuse and rehabilitation of existing urban development as a means to meet projected growth. Page 1-33

- The City should declare existing neighborhoods where reuse and rehabilitation are needed as a high priority when targeting public expenditures and other resources.

Policy 10 – Open Space and Natural Resource Conservation
It is the policy of the City to conserve and protect natural resources and planned open space areas, and to phase the conservation of agricultural lands to planned urban uses. Page 1-35

- The City will continue to provide open space for the preservation and conservation of natural resources. The City will continue programs established by the Department of Parks and Community Services in maintaining parks, trees, and other landscaping. The City will conserve riparian forests and grassland vegetation. The City will protect planned open space areas that support wildlife habitat and work with the County in protecting unique physical features. The City will establish development standards to enhance the visual amenities of open space areas.

- The City will provide open space for, and the conservation of the managed production of resources as defined in the Conservation and Open Space Element. The City will work with the County to study an agricultural preservation program. The City will allow the extraction of construction grade aggregate and assure that depleted aggregate pits are reclaimed for appropriate uses.

The City will provide open space for recreation. The American and Sacramento River Parkways will be conserved and protected. The city has other open space areas that can also be developed to their recreational use potential. These areas include utility easement, floodways and flood plains.

PP.2. Adopt a transit-oriented land use designation in the General Plan.

Transit-oriented development (TOD) is a term used to describe medium- to high-density development within a convenient walk of a major transportation stop. TOD's generally are comprised of a mix of residential, commercial, retail, and office uses. TOD's are less harmful to the environment than traditional development and can accommodate new growth without adding a burden to a jurisdiction's infrastructure. Residents and employees of TOD's drive less, conduct more activities on-site, and walk more than those in auto-oriented development. TOD's, if coupled with other planning tools such as urban growth boundaries, provide opportunities for better air quality, increased open space, and less land disturbance.

Example 1. County of Sacramento, General Plan Land Use Element

Urban Transit-Oriented Development.
The Urban Transit-Oriented Development designation allows mixed-use developments of relatively high residential densities and nonresidential intensities. Urban TODs are expected to be between 20 and 160 acres in size with residential densities in the core ranging from 7 to 50 units per gross acre, with a minimum average varying on the basis of location and facility status. The secondary areas surrounding the TOD cores are to have a minimum average density of 6 dwelling units per acre.

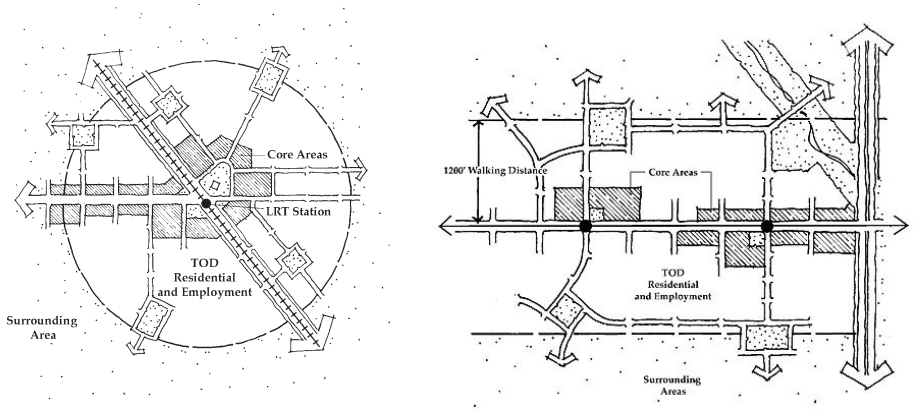
Neighborhood Transit-Oriented Development.
The Neighborhood Transit-Oriented Development designation allows mixed-use communities at moderate densities that are along the Feeder Line Network of the transit system and within 10 minutes travel time of the Trunk Line Network. Neighborhood TODs may be located on bus lines not shown on the Transportation Plan, or may be served by a private transit system (e.g., jitney, vanpool, transit shuttle service) as long as that transit meets the level of service defined for the Feeder Line Network. A Neighborhood TOD may be between 20 and 160 acres in size and have residential densities ranging from 7 to 30 units per gross acre with a suggested minimum average density varying on the basis of location and facility status. Like the Urban TOD, the secondary area in the Neighborhood TOD is to have a minimum density of 6 dwelling units per gross residential acre.

PP.3. Encourage new or denser development near transit nodes.

Policies that seek to place new or denser development near transit nodes puts housing, employment, and additional compatible uses within a convenient walking distance to one another. At the regional scale, this policy reduces the amount of sprawl development and reduces impervious land coverage.

Example 1. City of Sacramento, 65th Street/University Transit Village Plan

http://www.cityofsacramento.org/planning/longrange/South%2065th%20Area%20Plan/projdesc060403.pdf



Nodal (left) and corridor (right) transit-oriented development diagrams.
Source: Calthorpe Associates

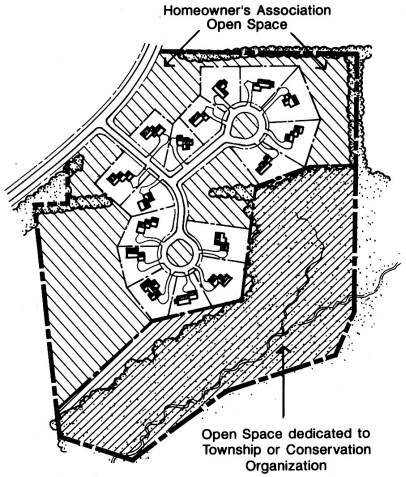
PP.4. Encourage cluster and compact development.

Cluster and infill development are tools that can assist in minimizing impervious surfaces and preserving open space. Cluster development, also termed cluster subdivision, open-space development, conservation development, hamlet development, and village development, is an important tool for open space and habitat preservation. Cluster development sites houses on smaller parcels of land than in conventional development requiring less road surface, while the land that would have been designated to individual lots is used as common shared open space. The open space is typically protected by a conservation easement that disallows any development in perpetuity.

Compact development, including infill development, is another important tool for land use planning. Compact development occurs in areas with existing development and intensifies uses on less land than conventional development. Jurisdictions that encourage compact development may provide more opportunities for open space and agricultural preservation.

Example 1. City of Palo Alto Comprehensive Plan

Policy N-7, City of Palo Alto Open Space Development Criteria
4. Development should be clustered, or closely grouped, in relation to the area surrounding it to make it less conspicuous, minimize access roads, and reduce fragmentation of natural habitats.



Cluster development can have the same number of residential lots with more open space than conventional development. This illustration shows open space ownership options.
Source: Growing Greener: Putting Conservation into Local Plans and Ordinances, Randall Arendt

PP.5. Adopt context-sensitive design for streets as a planning principle.

"Context sensitive design (CSD) is a collaborative, interdisciplinary approach that involves all stakeholders to develop a transportation facility that fits its physical setting and preserves scenic, aesthetic, historic, and environmental resources, while maintaining safety and mobility. CSD is an approach that considers the total context within which a transportation improvement project will exist."
(Source: Federal Highway Administration,
http://www.fhwa.dot.gov/csd/index.htm)

Example 1. California Department of Transportation, Division of Design Context Sensitive Solutions

Quality transportation design is the culmination of philosophy and principles in the project development process that provides a transportation system that enhances the place in which it serves. Whether a project is in an urban, rural or natural setting, the transportation facility must be in harmony with the community goals and the natural environment. The purpose of this (program) is to provide designers with department policy, guidance and examples to ensure the protection and enhancement of the environment and quality of life while meeting transportation needs in California.

http://www.dot.ca.gov/hq/oppd/context/

PP.6. Encourage reduced parking lot coverage.

Example 1. City of Olympia (WA) Public Works Department

1. Make reduction of impervious surfaces a goal of parking policies and regulations. Use site plan reviews and policy revisions as opportunities for addressing the problem of excess parking.

2. Establish parking requirements that accurately reflect parking needs for various land uses. Typically, parking regulations are based on artificially low "minimum" parking ratios that do not accurately reflect parking needs. Parking regulations should accurately reflect parking needs for various land uses and be based on high average use-instead of single peak day projections. Suggested ways to accomplish this goal include:

a. Establish "median" parking ratios that reflect parking needs;
b. If "minimum" ratios are used, establish "maximum" ratios in conjunction with minimums; and
c. encourage the use of transportation demand management techniques as an alternative to exceeding "median" or "maximum" ratios.

3. Establish cooperative parking regulations to reduce impervious surfaces. Smaller and fewer parking lots can result from cooperative parking. Developers and local jurisdictions can reduce the size of parking lots through shared, joint, or coordinated parking.

PP.7. Protect and strengthen existing ecological systems.

Example 1. City of Sacramento, General Plan, Section 6 Conservation and Open Space Element, Preservation of Natural Resources

Goal B
Retain the riparian woodlands and grassland vegetation along the waterways and floodways in North Natomas and South Sacrament insofar as possible. Page 6-13

Policy 1
Protect the wooded areas along the waterways and drainage canals insofar as possible.

Policy 2
Explore ways to conserve a modified floodplain environment along Laguna Creek in South Sacramento to the extent feasible.

Goal C
Conserve and protect the planned open space areas along the American and Sacramento Rivers, floodways and undevelopable floodplains to the extent feasible. Page 6-13

Policy 1
Retain the habitat areas where known endangered wildlife exists to the extent feasible.

Goal D
Work with the County of Sacramento to identify, protect and enhance physical features and settings that are unique to the area to the maximum extent feasible. Page 6-14

Policy 1
Conserve vernal pools with rear and endangered species to whatever extent feasible.

Goal E
Establish development standards for water related open space lands throughout the City to enhance the visual amenities of these uses. Page 6-14

Policy 1
Explore ways to reverse degradation and pollution and enhance the beauty and wildlife habitats of creeks and drainage canals.

Policy 2
Explore ways to preserve the undeveloped open space areas and wildlife habitats along Dry Creek, Arcade Creek, Magpie Greek, Fisherman's Lake, the area south of Woodlake Park, Morrison Creek, Elder Creek, Laguna Creek, Beach Lake and drainage canals.

Policy 3
Design new floodways to be built in North Natomas and South Sacramento, to be aesthetically pleasing and offer limited passive recreation as well as wildlife sanctuaries.
PP.3. Minimize impervious surfaces for all new development , require 10% of site to be landscaped and pervious surfaces.

Example 2. City of Sacramento, 65th Street/University Transit Village Plan.

Goals and Policies

C1. LAND USE

Open Space and Community Facilities Page 15

Goal 10: Promote a relationship to the natural environment and increase human comfort through use of appropriately suited vegetation.

10.1 A minimum of 10 percent of the site shall be landscaped and pervious surfaces. Landscaping that serves as a storm water treatment element and/or pedestrian plazas may be used to satisfy this requirement.

C3. CIRCULATION/INFRASTRUCTURE

Utilities Page 28

Goal 26: Ensure a balanced approach to resolving drainage and sewer issues through the transit village area.

26.2 In order to reduce impacts to existing and planned storm water and sewer drain system, new development will have a minimum target level of site perviousness of 10% (note: on site design improvements (e.g., parking lots as detention) off site improvements or fees may be required in lieu of this requirement). Site design mitigation measures, subject to the approval of the Utilities Director, may include: Barrier retention (berm, wall, planter, etc.), Depression storage (lawn, garden, parking lot, pond, athletic field, etc.), Land leveling, Terracing, Porous pavement, Driveway or parking lot under drain, shallow percolation (leach field), deep percolation (well), above-grade storage (rooftop, water tower), sub-grade storage (tank, rock layer), soil modification, re-vegetation (floor, canopy), structure on piers.

In accordance with the Federal Water Pollution Control Act, the City is required to implement a Comprehensive Storm Management Program in order to reduce pollutants in urban runoff to the maximum extent possible.

Example 3. City of Folsom, Humbug/Willow Creek Parkway Plan

PP.8. Maximize opportunities for creating open space.

Example 1. City of Sacramento, Multi-Family Residential Design Principles

Residential Design Element: Open Space/Landscaping

Principle: Residential projects should be designed to maximize opportunities for creating usable attractive, and integrated open space. Page 13

Note: Street design (cross sections) shall be compatible with the City Street Design Manual. All new landscaping shall comply with the City of Sacramento Water Conservation Ordinance.

PP.9. Regulate development adjacent to waterways.

Example 1. City of Sacramento, Sacramento River Parkway Plan

Chapter 3 Goals and Policies

Sacramento River Parkway Goals page 30
• To recognize the multiple use aspect of the Sacramento River Parkway for recreation, habitat preservation, and flood control.
• To preserve, protect and enhance the natural and cultural resources of the Parkway.

General Policies page 31
G4 The Parkway is primarily a recreational, open space, educational, and water oriented resource.

Recreational Use Policies page 32
R3 Recreational activities which are hazardous or incompatible with Parkway natural habitat and uses, or detrimental to adjacent and surrounding habitat are prohibited.
R4 All recreational development including trails, signs, structures and fences shall be constructed to prevent erosion, protect the structural integrity of the levee, and blend harmoniously with the surrounding landscape.

Natural and Cultural Resource Policies page 39
N1 Although the Parkway is to be developed for human use, the natural environment shall be protected, preserved, and enhanced to the fullest extent possible, especially large aggregations of riparian vegetation and wildlife.
N2 Public access in Nature Study Areas may be limited if access negatively affects a habitat restoration project or a listed threatened or endangered species.
N3 Development within the Parkway, including trails and roads, signs, and structures, shall be designed to minimize impact to native vegetation.
N4 Areas designated for habitat restoration shall be planted with native or indigenous species.
N8 Endangered or threatened species and their habitat shall be protected from encroachment by designating the area as Riparian Habitat Preserve or nature Study.

Erosion Policies page 39
E1 Reduce indiscriminate foot and bicycle traffic on levee slopes by providing trails, fencing, and signage to channel traffic to key points.
E2 Avoid use of soil sterilents or herbicides over large areas as this would encourage surface erosion.
E3 Indigenous grasses and other native vegetation should be used stabilize the soil and reduce rain water runoff

Chapter 3 Goals and Policies

Natural and Cultural Resource Policies page 39
N1 Although the Parkway is to be developed for human use, the natural environment shall be protected, preserved, and enhanced to the fullest extent possible, especially large aggregations of riparian vegetation and wildlife.

Example 2. City of Sacramento, American River Parkway Plan

Chapter 2 Goals and Policies

GOALS page 2-1
• To provide, protect and enhance for public use a continuous open space greenbelt along the American River extending from the Sacramento River to Folsom Dam; and
• To preserve, protect, interpret and improve the natural, archaeological, historical and recreational resources of the Parkway, including and adequate flow of high quality water, anadromous and resident fishes, migratory and resident wildlife, and diverse natural vegetation;

POLICIES page 2-1
1.0 Parkway Concept
1.1 The American River Parkway is a unique regional feature which shall be managed to balance the goal of preserving naturalistic open space and environmental quality within the urban environment, with plans to provide recreational opportunity in the Sacramento area.

2.0 Resources of the Parkway page 2-2
2.1 Any development within the Parkway, including buildings, roads, parking lots and turfed areas, shall be designed and located such that any impact upon native vegetation is minimized, and appropriate mitigation measures are incorporated into the project.
2.2 Phased plans with short and long-term measures for the enhancement of native vegetation and the elimination of undesirable nonnative vegetation shall be developed and implemented.
2.6 Where appropriate, areas which have been damaged by mining, flooding, or other adverse conditions should be reclaimed for recreational use consistent with this Plan or restored to a naturalistic condition, as determined by the designated land use category.

3.0 Water Flows, Water Quality and Flood Control page 2-3
3.1 Water flow in the Lower America River should be maintained at adequate levels to permanently sustain the integrity of the water quality, fisheries, waterway recreation, aesthetics, riparian vegetation, wildlife, and other river-dependent features and activities of the Parkway. The required flow levels of the Lower American River should be established at higher levels than those required under Decision 1400 of the State Water Resources Control Board. State and Federal Policy should provide for the maintenance of flows in the optimum range in the Lower American River.
3.3 Discharge or drainage of pollutants into the Lower American River shall be eliminated.
3.4 Levee protection and slope stabilization methods within the Parkway shall only be used when the Board of Supervisors determine that there is a demonstrated need to protect the health, safety and welfare of the community. The use of these methods shall result in minimal damage to riparian vegetation and wildlife.

Example 3. City of Folsom, Humbug-Willow Creek Parkway Plan

PP.10. Take advantage of opportunities presented by joint use facilities.

In many jurisdictions, existing recreational facilities may be designed to retain, or detain runoff requiring treatment from that area. Playing fields and parks may double as detention ponds and infiltration areas. Similarly, areas designated as ponds and infiltration areas may serve a dual role with landscaping requirements.

Example 1. City of Sacramento, Smart Growth Implementation Strategy, Page 1

Smart Growth Principles

2. Take advantage of existing community assets emphasizing joint use of facilities (e.g. park and detention basin)

Example 2. City of Sacramento, General Plan, Section 6 Conservation and Open Space Element

OUTDOOR RECREATION

Goal A
Conserve and protect the Sacramento and American Rivers, their shorelines and parkways. Page 6-16

Policy 2
Implement the goals and policies of the Sacramento River Parkway Plan, and amend the Plan to include updated information and recommendations form the Sacramento River Marina Carrying Capacity Study.

Policy 4
Work with the State to develop additional use of its open space areas at Cal Expo in a manner consistent with the American River Parkway Plan.

PP.11. Maximize use of pervious pavements.

Most auto-related uses require pavements. The use of pervious pavements can dramatically reduce impervious land coverage and minimize the creation of runoff. Pervious pavements are especially suitable for low-use parking areas, light use roadways, driveways, storage yards, and pedestrian areas. Pervious pavements include pervious concrete, porous asphalt, unit pavers on sand, crushed aggregate, and turf-block.

Example 1. City of San Jose, Draft Residential Design Guidelines

A. Minimization of Hardscape Areas
The hardscape or impervious areas of a site should be minimized in order to maximize permeable surfaces which absorb and biodegrade certain toxins. This will also reduce the volume of runoff into the storm drainage system.

1. For detached unit projects, hardscape areas in yard areas should utilize alternative surfaces such as raised wood decks, pavers, unmortared brick, stone or tile which allow absorption at joints and reduce runoff. Similar surface materials should be used for areas such as sideyards and entry walkways.

2. Multi-story buildings should be used rather than single-story buildings to reduce the building envelope size and maximize permeable surfaces.

3. Streets, driveways, and parking areas should be as small as possible within allowable standards.

PP.12. Maintain or establish open space requirements or buffer zones at creeks, create or preserve natural meanders.

Example 1. City of Palo Alto, Comprehensive Plan, Chapter 5, Natural Environment

The policy recognizes that activities beyond the riparian corridors can affect the integrity of the riparian area. The policy includes three programs:

1. Program N-7 adopts a 100-foot development setback, with some exceptions, from the top of the creek bank. The program also provides a border of native riparian vegetation at least 25 feet along the creek bank.

2. Program N-8 focuses on developing and adopting a creek ordinance.

3. Program N-9 focuses on regional planning efforts for a specific creek.

Example 3. City of Fairfield, Creekside Protection Plan

www.ci.fairfield.ca.us/city_code/chapter25/article_viii.htm

PP.13. Maintain surface and groundwater quality.

Example 1. City of Folsom General Plan, Open Space and Conservation Element

General Plan Policy 25.1.
The surface and groundwater quality of Folsom shall not be degraded from City standards.

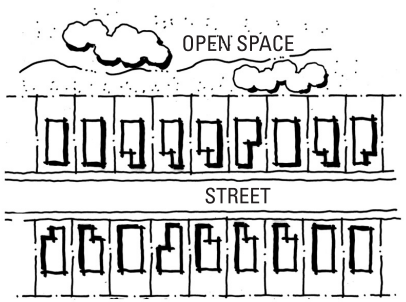
PP.14. Maintain quality and quantity of surface and runoff water to existing flows and quantities.

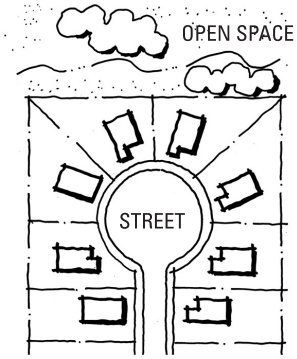
Example 1. City of Folsom General Plan, Open Space and Conservation Element

General Plan Policy 28.2
The quality and quantity of surface water runoff from a property shall not exceed existing flows or existing quality or shall comply with City standards for off-site drainage. The City shall implement a surface-runoff water quality monitoring program to insure compliance with City standards.

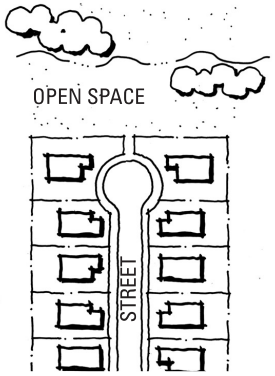
PP.15. Encourage public access and building orientation to open space; especially along creeks.

By encouraging public access and building orientation to creeks and open space, security is enhanced, and public understanding of riparian systems is increased. This reduces potential for dumping, illegal discharges, and crime. It also enables recreational uses and provides an important community amenity.

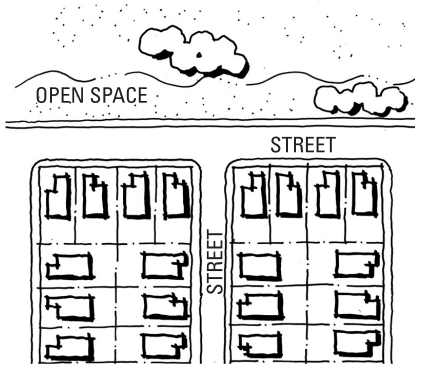




Discouraged: Residences should not back onto open space. This design limits access, reduces views, and minimizes maintenance and safety.



Acceptable: Residences can side onto open space while allowing access.



Preferred: Residences face the open space while allowing access and views.

PP.16. Develop hillside development ordinances to stipulate topographic sensitivity, setbacks, approval process

Example 1. City of Folsom, Hillside Development Ordinance

1. PURPOSE

The purpose of these Hillside Development Guidelines is to illustrate key design principles and issues which the Planning Commission, Architectural Review Commission and staff will use in evaluating applications for development of any site within those identified Hillside areas of the City. Significant hillside issues include street design, grading, site design, parking, drainage, architecture, landscaping, visual impact and preservation of natural features. Careful review and study of these issues is necessary to assure attractive developments which are sensitive to the surrounding environment.

The guidelines have been prepared to familiarize applicants with site design, architectural design and landscape design concepts encouraged by the City of Folsom and which will be applied by the Planning Department to evaluate compliance with the Hillside Ordinance.

2. INTRODUCTION

The majority of the hillside areas to which these guidelines will apply have been designated for single family development however, there may be opportunity for industrial and commercial development along the East Bidwell Street corridor north of Highway 50. For all areas, these Guidelines should be used in conjunction with the City-wide Design Guidelines, particularly for commercial and industrial development.

These Guidelines are based on principles established in the Hillside Development Procedures and Standards Ordinance (Ordinance No. 798). Where any inconsistency may occur, the language of the ordinance shall prevail.

3. STREET DESIGN

a. Street systems should be established to permit safe an efficient travel for motor vehicles, bicycles, and pedestrians, yet ensure ready access for fire and emergency vehicles.

b. Streets should be designed to reflect the type, density, scale, and character of hillside development. This will require sensitivity to grading, topography, existing vegetation, natural site features, and panoramic views. Alternative street designs require review by the Public Works and Planning Departments early in the design process.

c. Streets should generally follow the natural contours of the lands and should not be placed perpendicular to contour lines, unless absolutely unavoidable. Curvilinear streets are preferred, but sharp curves should be avoided that will hamper emergency access.

d. In order to reduce grading and allow for narrower residential streets, parking bays for guests and residents should be considered as an alternative to continuous curbside parking lanes. Parking lanes should not be included if the street does not provide direct access to abutting residences. However, parking bays may be needed for emergency turnouts or desired to provide parking at strategic vista points.

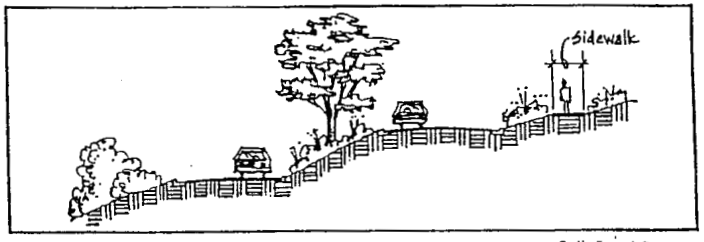
e. Where traffic volume will be low, such as on loop or cul-de-sac streets, and where the street will not be a bus route, street width should be reduced in accordance with City standards to minimize grading and paving. Limiting the width will preserve and enhance the hillside setting and discourage speeding. Fire Department access shall always be maintained.

f. Street design criteria may be reduced to promote slower traffic and to match existing contours while maintaining traffic safety. When ever feasible, a consistent design speed should be utilized for the entire street.

g. A vertically offset or split-level road designed along a hillside slope is desirable where it would minimize grading, preserve an important site feature, or enhance the hillside setting.

h. Arterial and collector streets should be designed to accommodate looped bus routes.

i. Where possible, major developments should include a minimum of two vehicular access points. Public and emergency access to natural and common open space should also be provided.



Split-Level Street

PP.17. Assess pollution loads and flows as new master plans are proposed.

Example 1. City of Manteca, estimated impacts of changing land use from agriculture to residential

One of the principles of the permit is to "use existing drainage plans to estimate increases in loads and flows." Workshop participants recognized an inherent difficulty in putting this principle into practice. Only one example was discovered during the preparation of this report.

CODES AND ORDINANCES

CO.1. Adopt smart growth codes and ordinances.

Example 1. City of Petaluma, Central Petaluma Specific Plan

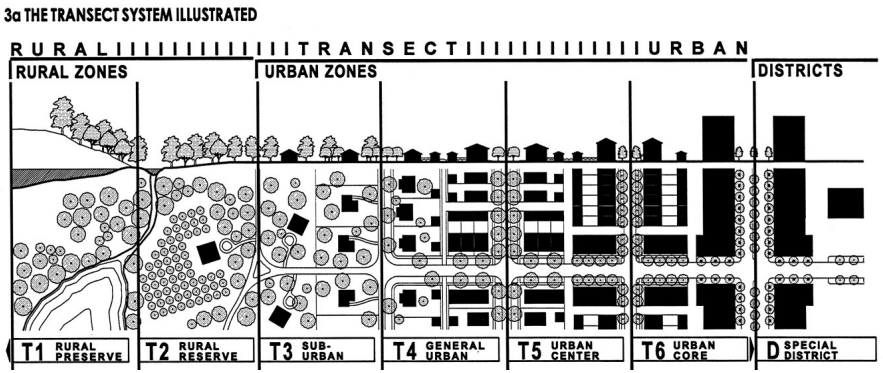
SmartCode is a transect-based code used as an instrument to implement smart growth principles. The code enables and qualifies community patterns that include clustering, traditional neighborhood development, and transit-oriented development within a regional system. The code integrates standards and methods of environmental protection and open space conservation. The intent of the code is to encourage community development that is diverse, compact, and walkable. In addition, the code encourages the protection of landscapes that are ecologically and culturally valuable.

Petaluma, California became the first municipality in the US to adopt the SmartCode. The 55,000-population city in Sonoma County, north of San Francisco, sees the new code as its best route for regulating development in a 400-acre, mostly industrial, partly greenfield area in the community's center.

http://www.ci.petaluma.ca.us/cdd/cpsp.html
www.smartcode.net

Example 2. The Local Government Commission has published a guide titled, "Overcoming Obstacles to Smart Growth through Code Reform".

http://www.lgc.org/freepub/PDF/Land_Use/sg_code_exec_summary.pdf



CO.2. Adopt transit-oriented zoning codes and ordinances.

Example 1. City of Mountain View, San Antonio Station Precise Plan

http://www.ci.mtnview.ca.us/citydepts/cd/apd/san_antonio_station_uses.htm

Powerpoint Presentation

http://www.lgc.org/freepub/land_use/presentations/mtnview_sgcodes02/index.htm

CO.3. Adopt context-sensitive street design in zoning codes and ordinances.

See PP.5. for resources and examples (p. 7)

CO.4. Develop codes and ordinances to regulate property along wetlands and riparian corridors.

Example 1. County of Sacramento, Zoning Code, Parkway corridor combining zone

ARTICLE 3: (PC) PARKWAY CORRIDOR COMBINING ZONE

235-30. Purpose

The Parkway Corridor (PC) Combining Zone as shown on the Comprehensive Zoning Plans shall be used to regulate property along the American River within the unincorporated area of the County. The goals promoted by establishment of this zone include:

(a) Preserve and enhance the American River and its immediate environment consistent with the goals and policies of the American River Parkway Plan, an element of the Sacramento County General Plan.

(b) Ensure, to the extent possible, the compatibility of land uses within the American River Parkway and land adjacent to the Parkway for their mutual benefit.

(c) Ensure that development with access within and adjacent to the American River Parkway is designed to reduce as much as possible visible intrusion into the Parkway and to complement the naturalistic amenities of the Parkway.

(d) Provide flexibility in development requirements such as setback, height, bulk and landscaping applicable to parcels of property subject to the regulations of the (PC) Parkway Corridor zone.

(e) Minimize risks to public health, safety and welfare in areas which are potentially threatened by erosional processes.

(f) Ensure that bluff development, including related storm runoff, foot traffic, site preparation, construction activity, irrigation and other activities and facilities accompanying such development, does not create or contribute significantly to problems of erosion or geologic instability on the site or on surrounding areas.

(g) Ensure that bluff development is sited and designed to assure stability and structural integrity for its expected economic lifespan while minimizing alteration of natural landform features.

(h) Ensure that development within the American River Parkway Corridor zone occurs in a manner which maintains a safe environment for homes and other improvements, and protects the aesthetic and environmental quality of the Parkway.

CO.5. Develop hillside development ordinances to stipulate topographic sensitivity, setbacks, approval process (see PP.16.)

Example 1. City of Folsom, Hillside Development Ordinance

Purpose

The purpose of the Hillside Development Guidelines is to illustrate key design principles and issues which the Planning Commission, Architectural Review Commission, and staff will use in evaluating applications for development of any site within those identified Hillside areas of the City. Significant hillside issues include street design, grading, site design, parking, drainage, architecture, landscaping, visual impact, and preservation of natural features. Careful review and study of these issues is necessary to assure attractive developments which are sensitive to the surround environment. The Guidelines have been prepared to familiarize applicants with site design, architectural design, and landscape design concepts encouraged by the City of Folsom and which will be applied by the Planning Department to evaluate compliance with the Hillside Ordinance.

CO.6. Author codes to reduce pollutants in stormwater.

Example 1. City of Sacramento, City Code, Stormwater Section

13.16.120 Reduction of pollutants in stormwater.

B. Development.

1. The enforcement official may develop controls as appropriate to minimize the long-term, post construction discharge of stormwater pollutants from new development(s) or modifications to existing development(s). Controls may include source control measures to prevent pollution of stormwater and/or treatment controls designed to remove pollutants from stormwater.

2. Any person performing construction in the city shall prevent pollutants from entering the stormwater conveyance system and comply with all applicable federal, state and local laws, ordinances or regulations including but not limited to the general permit for stormwater discharges associated with construction activity and the city grading, erosion and sediment control ordinance (City of Sacramento Ordinance No. 93-068).

CO.7. Stipulate legal authority to require source and treatment controls are given to agency head.

Example 1. The City of Sacramento's Stormwater Ordinance provides the legal authority to require source and treatment controls for new development/redevelopment. The ordinance states:

13.16.120 Reduction of pollutants in stormwater. B.1

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1. The enforcement official may develop controls as appropriate to minimize the long-term, post construction discharge of stormwater pollutants from new development(s) or modifications to existing development(s). Controls may include source control measures to prevent pollution of stormwater and/or treatment controls designed to remove pollutants from stormwater.

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The entire ordinance can be found at www.sacstormwater.org (Stormwater Ordinances, Stormwater Management and Discharge Control).

STANDARDS & GUIDELINES

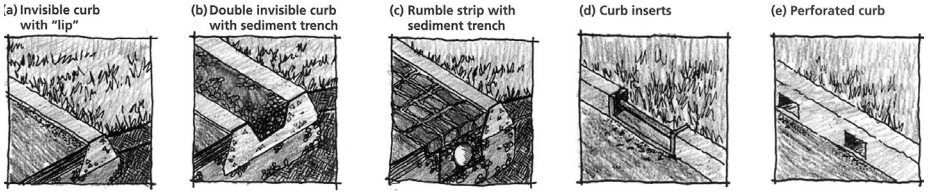
SG.1. Develop context-sensitive street standards and guidelines.

Example 1. Green Streets: Innovative Solutions for Stormwater and Stream Crossing, Portland Metro

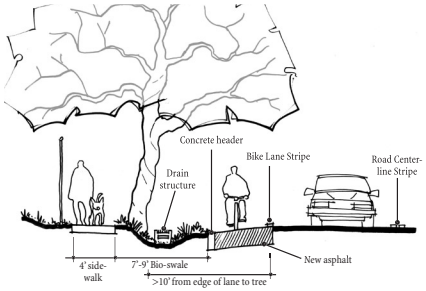
http://www.metro-region.org/article.cfm?articleID=235

Example 2. The Broadview Green Grid Project

http://www.ci.seattle.wa.us/util/NaturalSystems/broadview.htm

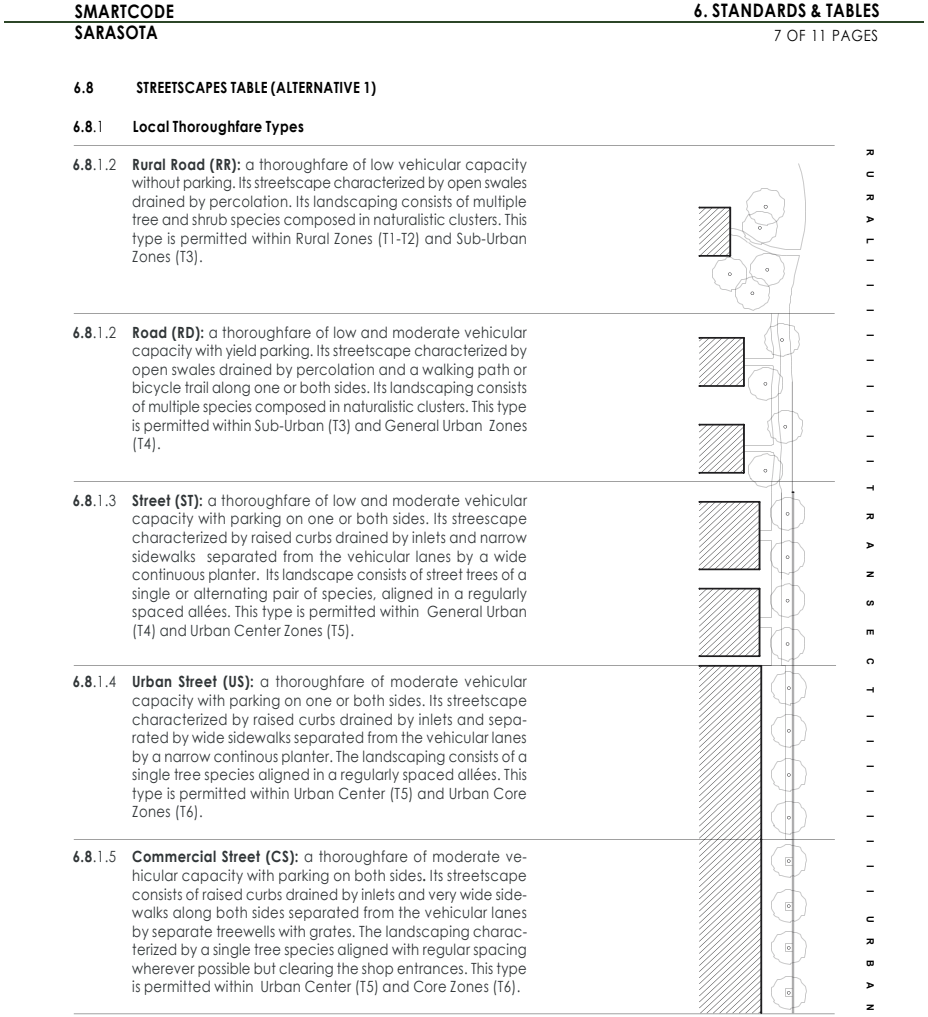


Details for street designs that incorporate stormwater infiltration.
Source: Green Streets: Innovative Solutions for Stormwater and Stream Crossings, Portland Metro



Street section with bio-swale and photograph of built example in Seattle, Washington.
Source: Cunningham Avenue, San Jose (left), Broadview Green Grid Project website (right)

Example 3. SmartCode, Duany Plater-Zyberk & Co., 2001
Smart Growth principles include street standards and guidelines to ensure that street widths support multiple goals of accommodating traffic, encouraging pedestrians, and improving environmental quality.



SMARTCODE **6. STANDARDS & TABLES**
SARASOTA 7 OF 11 PAGES

6.8 STREETSCAPES TABLE (ALTERNATIVE 1)

6.8.1 Local Thoroughfare Types

6.8.1.2 Rural Road (RR): a thoroughfare of low vehicular capacity without parking. Its streetscape characterized by open swales drained by percolation. Its landscaping consists of multiple tree and shrub species composed in naturalistic clusters. This type is permitted within Rural Zones (T1-T2) and Sub-Urban Zones (T3).

6.8.1.2 Road (RD): a thoroughfare of low and moderate vehicular capacity with yield parking. Its streetscape characterized by open swales drained by percolation and a walking path or bicycle trail along one or both sides. Its landscaping consists of multiple species composed in naturalistic clusters. This type is permitted within Sub-Urban (T3) and General Urban Zones (T4).

6.8.1.3 Street (ST): a thoroughfare of low and moderate vehicular capacity with parking on one or both sides. Its streescape characterized by raised curbs drained by inlets and narrow sidewalks separated from the vehicular lanes by a wide continuous planter. Its landscape consists of street trees of a single or alternating pair of species, aligned in a regularly spaced allées. This type is permitted within General Urban (T4) and Urban Center Zones (T5).

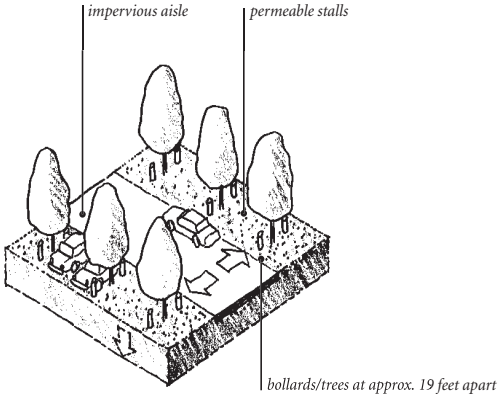
6.8.1.4 Urban Street (US): a thoroughfare of moderate vehicular capacity with parking on one or both sides. Its streetscape characterized by raised curbs drained by inlets and separated by wide sidewalks separated from the vehicular lanes by a narrow continous planter. The landscaping consists of a single tree species aligned in a regularly spaced allées. This type is permitted within Urban Center (T5) and Urban Core Zones (T6).

6.8.1.5 Commercial Street (CS): a thoroughfare of moderate vehicular capacity with parking on both sides. Its streetscape consists of raised curbs drained by inlets and very wide sidewalks along both sides separated from the vehicular lanes by separate treewells with grates. The landscaping characterized by a single tree species aligned with regular spacing wherever possible but clearing the shop entrances. This type is permitted within Urban Center (T5) and Core Zones (T6).

RURAL ——— TRANSECT ——— URBAN

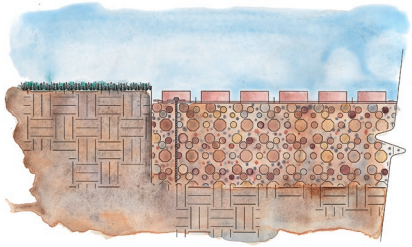
SG.2. Develop parking standards requiring pervious paving.

Example 1. Start at the Source, Design Guidance Manual for Stormwater Quality Protection, 1999 Edition



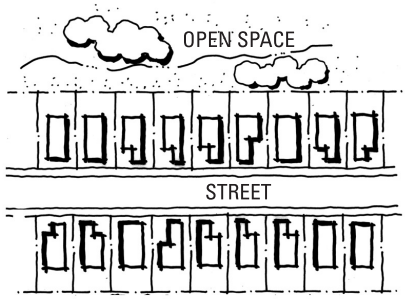
Pervious paving design diagram (left), pervious parking grove (Sonoma County, California) (middle left), GravelPave details (bottom left and right)

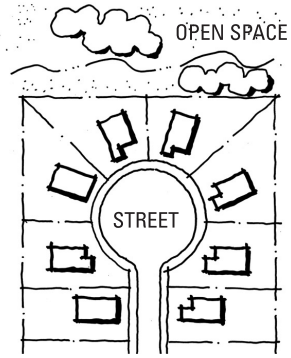
www.invisiblestructures.com



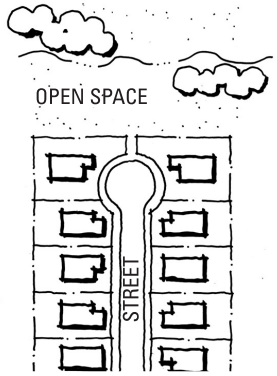
SG.3. Author standards to regulate the development adjacent to waterways.

Example 1. Conceptual illustrations (below)

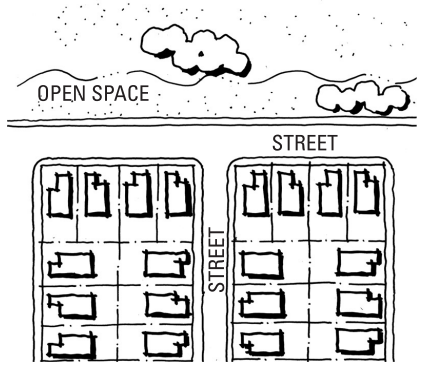




Discouraged: Residences should not back onto open space. This design limits access, reduces views, and minimizes maintenance and safety.



Acceptable: Residences can side onto open space while allowing access.



Preferred: Residences face the open space while allowing access and views.

SG.4. Incorporate BMPs in new and re-development and require them as a condition of approval for projects.

Example 1. California Stormwater Quality Association, Stormwater Best Management Practice Handbook, New Development and Redevelopment (CASQA BMP Handbook)

A partial list of relevant topics in the manual include:

- Stormwater Quality Planning for New Development and Redevelopment,
- Developing a Stormwater Management Plan,
- Identifying Candidate BMPs,
- Planning Principles,
- Site and Facility Design for Water Quality Protection,
- Source Control BMPs,
- Treatment Control BMPs, and
- Long-Term Maintenance of BMPs

www.casqa.org
www.cabmphandbooks.com

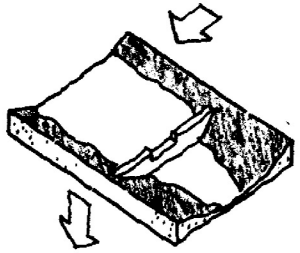
Example 2. City / County of Sacramento On-site Guidance Manual

www.sacstormwater.org

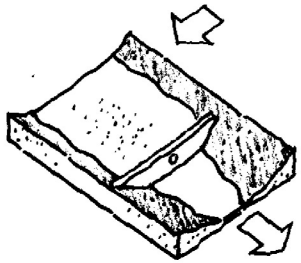
Example 3. Start at the Source, Design Guidance Manual for Stormwater Quality Protection, 1999 Edition

SG.5. Establish design standards for BMPs.

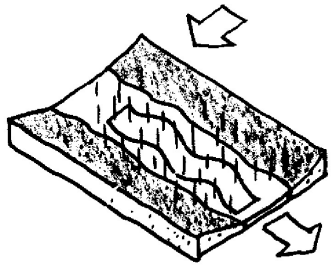
Example 1. See California Stormwater Quality Association, Stormwater Best Management Practice Handbook, New Development and Redevelopment



SG.6a. Infiltration basin



SG.6b. Retention / detention basin



SG.6c. Biofilter

SG.6. Develop a plant selection list to advise users.

It is desirable to have a list of appropriate plants for use in stormwater BMPs within Sacramento County. Other jurisdictions have developed similar lists for creekside or riparian areas.

Example 1. County of Sacramento Planting List

Example 2. Marin County Stormwater Pollution Prevention Program, http://mcstoppp.org/Plants.htm